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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,767	12/23/2004	Hiromu Ueshima	100341-00057	6783
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ARENT FOX LLP 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036			EXAMINER SHAH, MILAP	
			ART UNIT 3714	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/517,767

Applicant(s)

UESHIMA ET AL.

Examiner

Milap Shah

Art Unit

3714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date 2/2/09
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 11-16, & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manwaring (U.S. Patent Application Publication No. 2002/0098897) in view of Numazaki et al. (U.S. Patent No. 6,144,366) & Poillon et al. (U.S. Patent No. 5,056,791).

Claims 1, 15, 16, & 18: Manwaring discloses the invention substantially as claimed including an information processing apparatus or man-machine interface system provided with an input system utilizing a stroboscope, comprising: a stroboscope (figure 1[flash units 42a, 42b, 46a, or 46b]); an imaging means for imaging an object (i.e. a golf ball) to output an image signal of the object (figure 1[cameras 26, 28]); and a first means for calculating at least a velocity of the golf ball (paragraph 0090 discusses the calculation of the golf ball velocity). Manwaring also discloses a retroreflective body or reflective material affixed to the object, such as a golf club (figure 3).

Manwaring lacks two aspects of at least claim 1, including (1) the imaging means imaging the golf ball at both light emission and non-light emission, further, calculating the various golf club or golf ball properties (i.e. velocity, spin, angle, etc) based on a difference of images taken at light emission and non-light emission; and (2) a second means *for* performing information processing on the basis of the information calculated by the first means (i.e. clearly Manwaring has the “means”, as in a computer processor, however, Manwaring lacks explicit disclosure of the functional language associated with the second means).

As to point (1) above, Manwaring discloses one such technique of using an imaging means (i.e. cameras) and a stroboscope (i.e. flashing units) to calculate various properties of both a golf club and a golf ball. As this technique differs from the claimed invention, the Examiner submits that Numazaki et al. explicitly disclose a technique of generating information input using reflected light images of a target object using the specific technique of differencing images taken at light emission and non-light emission of a target object having reflective areas similar to those of the golf club and golf ball of Manwaring and Applicant's invention. Numazaki et al., at column 10, lines 40-56, explicitly disclose that a method of detecting reflected light received from a target object via photo-detection detects not only the light emitted by a lighting unit, but also external light such as sunlight, thus, for this reason it would be beneficial to take the difference of a received light amount detected when a lighting unit is emitting light and a received light amount detected when a lighting unit is not emitting light, so as to obtain only a component for the reflected light. Granted, Numazaki et al. is directed towards a target object being a human hand for obtaining imaging of hand gestures, however, the method of detected reflected light at light and non-light emission as discussed appears applicable to a plethora of different inventions in which a motion of a target object is to be detected. Therefore, one of ordinary skill in the art at the time the invention was made would have been motivated to modify Manwaring with the additional step of imaging at non-light emission to further difference pairs of images (i.e. one taken at light emission and an adjacent or next image in time sequence taken at non-light emission) to better obtain reflected light data to analyze for various characters of the golf club and golf ball during a particular swing.

As to point (2) above, it is notoriously well known in the golf arts to obtain analyzed swing data and use such data to simulate the swing in a virtual environment or a game, such that a player has the excitement of a real-life physical swing corresponding to an in-game trajectory and

resulting swing for a golf game. To avoid mere assertions of such being notoriously well known in the art, the Examiner submits that Poillon et al. explicitly disclose a golf simulator and analyzer which analyzes a golf swing and places the would-be real swing into a virtual environment or golf game. Granted, the analyzing methods used by Poillon et al. are different then both of Manwaring & Numazaki et al, however, Poillon et al. explicitly teach a second means for performing information processing according to an application (i.e. the virtual environment or game) on the basis of information calculated by a first means (i.e. in this combination, the first means refers to the differencing technique of Numazaki substituted within Manwaring) to provide an output according to the application, wherein the first means merely analyzes a swing and calculates various characteristics or properties of the golf club and golf ball for a particular swing via the differencing technique. Therefore, it would have been obvious to modify the combination of Manwaring and Numazaki et al. as discussed above with the addition of further processing calculated data to be used in a golf game or virtual environment as is explicitly taught by Poillon et al. at least for the purpose of providing a simulation of a real-life golf swing in a golf game or golf training environment to improve a player's golf game and provide enjoyment while doing so.

For at least the reasons provided above, it would have been prima facie obvious to modify the golf swing analyzing invention taught by Manwaring to specifically analyze a swing using an improved swing as taught by Numazaki et al. for at least the reason that external light may hinder accurate analyzing of a golf swing, and further modify the combination of Manwaring & Numazaki et al. to perform additional information processing using information processed during a first calculating means (i.e. golf club and golf ball swing data) for the purpose of providing an enjoyable simulation of a real-life golf swing, such as in an area where a real golf swing would not be possible (i.e. using tee and screen as seen in figure 1 of Poillon et al.). Those skilled in the art would be motivated to make such improvements taught by both Numazaki et al. & Poillon et al. to

Manwaring to improve both the imaging/calculating means to provide an enjoyable output to all the calculations performed.

Regarding claim 18, it appears claim 18 recites merely a computer program in which a processor of an information processing apparatus executes to perform the imaging, first processing step, and second processing step as discussed above with respect to claim 1. It appears each of the references in some way discloses a computer to analyze the swing or apply the swing data to an application, thus, the combination appears to teach a storage medium storing a program by which a processor of an information processing apparatus provided with an input system utilizing a stroboscope executes the steps corresponding to the means-plus-function recitations of claim 1. For at least these reasons, the combination of Manwaring, Numazaki et al., and Poillon et al. make obvious the invention as claimed.

Claims 2 & 3: The combination of Manwaring, Numazaki et al., and Poillon et al. appears to disclose a determination means for determining whether or not the information based on the differences is coincident with a predetermined condition (i.e. Numazaki teaches in one application that the difference is analyzed to determine if a command is present, such as a gesture with a finger to provide a command to an input system; the Examiner submits that implementing this technique into Manwaring for a golf swing, the data may be compared to a correct swing to determine if the golfer's swing is proper). Regarding claim 3, given the reflective material disclosed by Manwaring, broadly, it appears only the "valid information" or data pertaining to those reflective points is transmitted to the second means, versus sending all images taken at light emission and at non-light emission.

Claims 4 & 5: The combination of Manwaring, Numazaki et al., & Poillon et al. disclose calculating a distance between the object or golf ball and the imaging means from the information indicative of a size of the golf ball, such as when a trajectory is calculated via the various

measurements/calculations as described in any of the three references, where the trajectory includes a calculation of a distance between the golf ball and the imaging means as it simulates the trajectory. The trajectory appears to be based on the size of the object measured throughout the imaging of the object in flight (i.e. Poillon et al. disclose similar calculations of a ball in flight and obtaining a trajectory, such calculations would have been an obvious matter of design choice to be implemented within Manwaring, as being well known possible calculations in the golf art). And, as part of the trajectory calculations, based on the shape and path of the golf ball, angles are calculated to provide a realistic trajectory.

Claim 6: Manwaring explicitly discloses calculation of an angle via predetermined points by calculating an angle between a line segment between the predetermined points and a predetermined coordinate axis (figures 12 & 13).

Claims 7-9: Manwaring appears to explicitly disclose that the time interval of light emission of the stroboscope or flashing units is freely settable (i.e. freely configuring length of light emission and non-light emission) and that the exposure period of the imaging means is freely configurable (i.e. it appears these intervals and lengths are dynamically determined based on an initial golf club head speed, thus, it appears any of these intervals and lengths would be freely configurable, see at least figures 5-11 and paragraphs 0066-0072).

Claims 11-13: The combination of Manwaring, Numazaki et al., & Poillon et al. disclose light sources for outputting light having a specific wavelength range and that the imaging means responds to only that specific wavelength. Further, disclosed is a filter for passing the particular wavelength and blocking light of any other wavelength. See at least column 12, lines 6-12 of Numazaki et al., which feature can be implemented in the Manwaring invention as an additional improvement to the imaging of reflected light (i.e. an additional layer of obtaining more precise

swing data by imaging correctly reflected light that was emitted via the light sources versus other external light).

Claim 14: Clearly, any one of the inventions disclosed by Manwaring, Numazaki et al., & Poillon et al. or more specifically the combination of Manwaring, Numazaki et al., & Poillon et al. disclose the first means and second means as being a computer processor that obtains the swing data signals, analyzes the data, and outputs the data in at least the arrangement discussed above with respect to a golf game or virtual environment.

Response to Arguments

The Examiner hereby withdraws the 35 U.S.C. 101 rejection in view of amendments that appear to overcome the issues presented in the previous office action. Similarly, in view of the amendments, the double patenting rejection of claim 16 is hereby withdrawn.

Applicant's arguments filed February 2, 2009 have been fully considered but they are not persuasive.

The totality of Applicant's argument appears to be against the combination of Manwaring and Numazaki, alleging that the differencing technique disclosed by Numazaki would render the device and method of Manwaring unnecessarily cumbersome, since Manwaring is not concerned with any inadvertent appearance of room light. The Examiner respectfully disagrees. First, Applicant's numerous arguments regarding room light do not appear to be commensurate with the scope of the claims, as the claimed invention does not appear to specify any preference to overcome room light using the claimed technique of differencing images.

Manwaring merely teaches one such means for determining various characteristics of a golfer's ball strike and thus teaches an application of imaging a golf club using one such known technique including a stroboscope and reflective material affixed to the club. The Examiner maintains that Numazaki merely

discloses one other known means for determining a target objects location, position and the like using reflected light images and differencing of images at light emission and at a non-light emission. The Applicant alleges implementing the technique disclosed by Numazaki within Manwaring would lead to requiring complex processing to determine the velocity of a golf club. In regards to at least claim 1 and new claim 18, while Applicant alleges that Numazaki's differencing technique is cumbersome and is significantly more complex than the claimed invention, such complexity does not preclude obviousness. In Applicant's *claimed* invention, substantially broad language is used to merely recite the imaging of an object at light emission and at non-light emission, then merely performing "calculating" to determine such characteristics as velocity, based on differences between a plurality of image signals at light emission and at non-light emission. There appears to be no specificity in the *claimed* invention as to the specifics of the technique used to difference the images. Consequently, the Examiner respectfully submits that Numazaki, given such broad language, broadly teaches that an object is imaged at light emission and at non-light emission and some type of calculation is performed to determine at least the velocity of the object based on differencing images at light emission and at non-light emission. It would have been further obvious to substitute one known technique for another to provide a predictable or expected result. For instance, implementing Numazaki's differencing technique into Manwaring provides an expected result including more precise data regarding the golfer's swing and striking of a golf ball. Further, beyond mere substitution, adding an additional layer of accuracy to Manwaring in view of Numazaki would have motivated those skilled in the art to image the golf club at non-light emission periods as well as light-emission periods in the context of Manwaring as taught by Numazaki to increase the accuracy of the 'first means'.

Accordingly, the Examiner respectfully submits that the combination of Manwaring & Numazaki is a proper combination where one such technique for determining various characteristics of a target object, such as the technique taught by Numazaki is substituted within Manwaring that teaches a golf

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application of an invention regarding determining a golfer's striking parameters for a golf swing. Further, given all Manwaring offers including the reflective material on the golf club would have merely strengthened the differencing technique of Numazaki. In contrast to Applicant's argument, the Examiner is not persuaded that the incorporating the reflective material in a differencing of images at light emission and at non-light emission is non-obvious in view of Manwaring and Numazaki.

Since the Applicant does not appear to argue against the Poillon reference, the Examiner assumes that Applicant acquiesces in regards to the second means for performing information processing. Poillon, as noted in the updated rejection, also discloses the newly added language such that the second means for performing information processing according to an application (i.e. the virtual environment or game) on the basis of the information calculated based on the differences by the first means to provide an output according to the application (i.e. the virtual environment or game implements the output data from the first means as taught by the combination of Manwaring and Numazaki to provide an output in the virtual environment or game).

In regards to claims 2 & 3, the rejections are updated above to better address the limitations in view of the combination of references.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Milap Shah whose telephone number is (571) 272-1723. The examiner can normally be reached on M-F: 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571) 272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MBS/

/Peter D. Vo/
Supervisory Patent Examiner, Art Unit 3714